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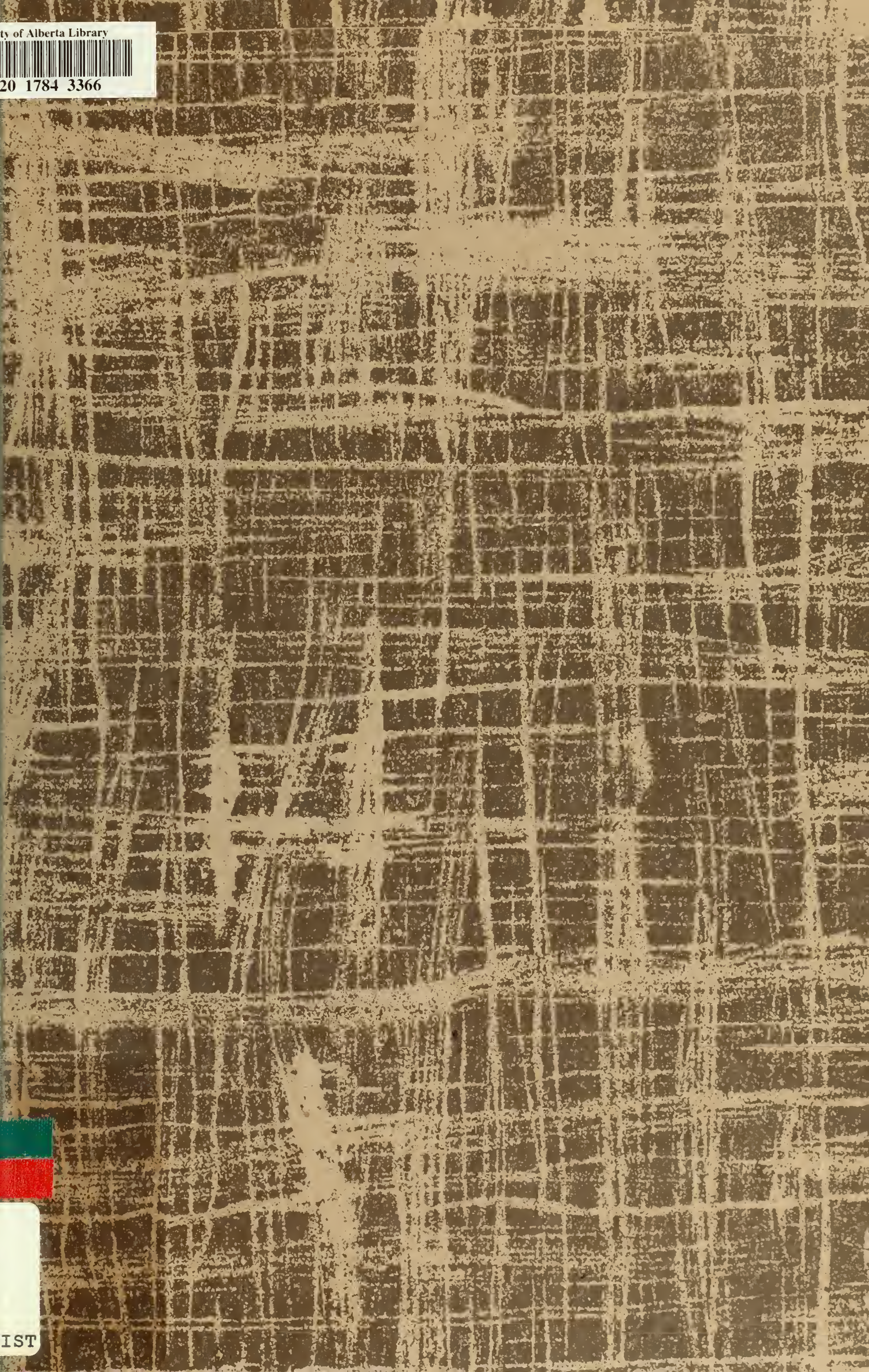

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DAIRY PRODUCTION TECHNICIAN

Course: **Animal Husbandry and Health 33**

Program: Green Certificate

Credits: 6

Corequisite: CTR1210: Personal Safety (Management)
Note: Students are required to complete the corequisite course prior to or concurrent with their enrollment in the first course of the Dairy Production Technician specialization.

Description: Students demonstrate the ability to handle cattle, perform castration by elastrator, maintain cattle health, water cattle, perform safety practices, and demonstrate effective and appropriate employability skills.

Parameters: Each of the three courses that constitute the Dairy Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• demonstrate the ability to: – care for newborn and weaner cattle – maintain calf rearing facilities – dehorn calves – tag and tattoo cattle	• ongoing assessment of student performance, which is conducted: – on a daily basis by the student's on-farm trainer in regular consultation with the student's supervising teacher	30%
	• certification testing, which is conducted by a Green Certificate Assessor designated by AAFRD and includes:	
• demonstrate the ability to perform castration by elastrator	– a performance assessment of practical knowledge and skills – a written examination.	15%
• demonstrate the ability to maintain cattle health, by: – identifying dairy cattle disorders and diseases	Successful completion of this course will be credited toward the attainment of the Dairy Production Green Certificate Technician credential.	15%

Course: Animal Husbandry and Health 33 (continued)

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will: – identifying cattle abnormalities – treating cattle disorders and diseases – handling cattle medications – monitoring the calving process		
• water cattle		20%
• demonstrate safe practices, by: – identifying locations of and operating fire extinguishers – performing emergency first aid		10%
• demonstrate effective and appropriate employability skills.		10%

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Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
Calf Care • Caring for Newborns to Weaners	• define colostrum • describe of nature of colostrum • describe the importance of colostrum to calf nutrition and vitality • prepare an appropriate feeding amount of colostrum, and carry out initial feedings of new calves • prepare the regular calf feed; e.g., milk replacer or regular milk, according to the farm's protocol • perform daily feeding of calves, including clean-up • describe the nature, purpose and practice of navel dipping • select the proper disinfectant and perform navel dipping • describe the changes that occur to the rumen as the calf ages • identify and describe changes to animals' feeding programs, based on changes to their digestive system • identify and describe the four stomachs of cattle • identify and describe the visual symptoms of scours and pneumonia • monitor calves for signs of ill health during the daily calf care work routine • explain the importance of tagging newborn calves	Colostrum is the first milk produced by the animal after calving. Navel dipping is the process of preventing navel infection in newborns. Navels of newly born calves are susceptible to disease. Symptoms include swelling and stiff joints. Treatments include in-time disinfectant and use of application aids. The four stomachs of cattle are: • rumen • reticulum • omasum • abomasum (true stomach). The rumen needs to develop the ability to digest forages and grains. • Early solid feeds are calf starters. • Dry feeds are started according to the feeding protocol. • Forages feed may be hay, haylage or silage. Scours is the inability to absorb food. Symptoms are diarrhea and dehydration. An early sign is the presence of watery and loose manure. Other signs are depressed movements and sunken eyes. When calves are handled, all farm workers need to be vigilant for scours and other diseases and conditions. Early signs of pneumonia include a persistent hacking cough and other respiratory problems. Other signs include watery eyes, runny nose and fever.

Concept	Prescribed Specific Outcomes	Notes
• Calf Rearing Facilities	*The student will:* • identify and describe the environmental—housing, cleanliness, care—factors that affect calf health and development • describe the relative importance of each factor • identify and describe the regular cleaning and bedding management protocol for a calf rearing facility • carry out the regular cleanliness and sanitation maintenance of the calf pen • identify cleaning and sanitizing agents used to clean and sanitize calf pens • perform cleaning and disinfecting duties	A calf rearing facility is one in which animals are kept for the first 60 days after birth. Factors affecting calf health include: • air quality—temperature, ventilation, humidity • sanitation—of pens, of feeding utensils • disease control • insect and parasite pest control • space • feeds and feeding practices. Cleaning/sanitation: • will depend on the style of calf housing; e.g., hutches, group pens • is performed according to a protocol, based on daily, weekly or monthly duties • includes cleaning out manure • includes bedding quality standards • includes maintaining feed and water containers in clean and working condition • includes regular cleaning and sanitizing of feeding utensils. Chemical sanitizers used include: • creosote • hydrated lime • iodine-based spray. From a business perspective, cleanliness and sanitation are critical to ensuring that calf mortality rates are maintained within expected goals.

Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
• Calf Dehorning	*The student will:* • identify and describe the alternative practices and techniques commonly used for calf dehorning • describe the optimum age for dehorning • explain the reasons for dehorning calves • identify and describe possible hazards, to the operator and to the animal, associated with dehorning • identify dehorning techniques that will minimize injury or damage • restrain the animal, and perform the horn removal procedure • describe post-dehorning complications that may arise • monitor the calf for signs of ill health after dehorning	Dehorning is performed: • to protect other animals • to protect operators • for aesthetics. Tools used to dehorn cattle include: • gougers • paste • electric dehorners. Dehorning hazards include: • handling rambunctious animals • operator can be cut, burned or poisoned • misapplied paste may cause skin burns on the animal. Correct dehorning procedure includes: • proper restraint of the animal • sure, confident handling of tools and equipment • minimizing stress to the animal • ensuring the animal is in good condition before dehorning • removing only essential horn material. Proper restraint includes: • holding the animal for the operation, with concern for its welfare • performing work quickly and efficiently • minimizing stress to the animal • maintaining proper cleanliness and sanitation. Potential complications include: • excessive blood loss • not removing all horn-producing tissue • infection or parasite infestation • shock.

Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
• Tagging and Tattooing Cattle	• explain reasons for tagging and tattooing cattle • identify and describe applicable breed regulations governing tagging and tattooing • identify body areas of cattle used when tagging or tattooing • identify and describe common types and methods of tagging and tattooing • describe, for each tagging or tattooing method: – the best time to use the process – best practices for the process • describe potential health and safety hazards of tagging or tattooing processes • describe techniques of minimizing health and safety hazards • demonstrate proper tagging and/or tattooing techniques.	The Canadian National Livestock Record governs the tagging and tattooing system. Breed associations maintain specific regulations. Factors in timing the tagging/tattooing process include: • season • size of the animal • loss and catch hazards. Proper tagging and tattooing techniques should ensure: • minimal stress to the animal • tag/tattoo has correct information • tag/tattoo is readable.
Castration by Elastrator	• identify and describe how the castration by elastrator technique works • describe the purpose of castration • restrain the animal properly prior to castration • perform castrations correctly, using the elastrator • identify and describe potential post-operative complications, and monitor regularly • monitor castrated animals for possible problems.	A castrated bull is referred to as a steer. When performing this technique, appropriate sanitation and cleanliness, and concern for the animal's welfare, need to be maintained.

Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
Cattle Health • Dairy Cattle Disorders and Diseases (continued)	*The student will:* • describe and explain the purpose and importance of a herd health program • identify and describe the basic nature and characteristics of dairy cattle disorders and diseases • identify and describe the general effects of identified disorders on dairy animals • identify and describe the general effects of identified diseases on dairy animals • identify and describe the prevention or medicinal treatment protocol for the following bacterial diseases: – calf scours – foot rot – mastitis – navel ill – pneumonia • identify and describe medicinal and prevention/vaccination treatments used for the following viral diseases: – bovine viral disease – infectious bovine tracheitis – parainfluenza-3 – shipping fever – warts • identify and describe appropriate medicinal or preventative treatments for the following parasitic diseases: – lumpy jaw – ringworm • identify and describe the basic nature, characteristics and effects of parasitic diseases	Disease is one of the greatest enemies of the dairy farmer. All farm workers must be aware that they are responsible for observing the herd, noting abnormalities and reporting the abnormalities to their supervisors. Disease prevention is easier than attempting to cure disease. For this reason students must be aware that cleanliness and sanitation are critical procedures in any herd health program.

Concept	Prescribed Specific Outcomes	Notes
(continued)	*The student will:*	
• Dairy Cattle Disorders and Diseases	• identify and describe the prevention or medicinal treatment protocol for the following parasites: – black flies – warbles/grubs – cattle lice – flies – mosquitoes – roundworms – screwworms/maggots • identify and describe the prevention or medicinal treatment protocol for the following protozoa-caused disease: – bovine coccidiosis • identify and describe the basic nature and characteristics of anaphylactic shock • identify and describe the prevention or medicinal treatment protocol for the following animal injuries: – chapped teats – displaced abomasum – hardware disease (wire in stomach) • identify and describe the prevention or medicinal treatment protocol for the following feeding related disorders: – nitrate poisoning – bloat – rumen overload/acidosis	
• Cattle Abnormalities	• identify visually normal conditions of cattle • identify abnormal behaviour of cattle • use appropriate techniques for assessing the health and condition of individual animals in a group • identify normal/abnormal respiratory conditions • identify methods for assessing respiratory problems	The student will learn through observation over time what constitutes visually normal behaviour and conditions.
(continued)		

Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued) • Cattle Abnormalities	*The student will:* • identify and describe signs of ill health or sickness relating to: – coat sheen – gut fill • identify and describe symptoms of dehydration • describe signs of cattle health or sickness from observations of cattle: – movement/behaviour – walking – noises – urine and manure • describe appropriate operator behaviour when checking the health of cattle • observe a group of cattle, and determine if an observed condition is isolated to one animal or evident in many • maintain a daily log of health irregularities identified	
• Handling Medications (continued)	• identify and describe the purpose and general use of the following in treating dairy cattle: – antibiotics – vaccines – disinfectants – insecticides – nutrient supplements; e.g., calcium, phosphorus, glucose • read and interpret drug or product labels • describe the concept of drug withdrawal • describe the importance of drug withdrawal to the production of quality milk • identify protocols in the farm's medication handling policy relating to: – milk production – shipping milk • identify and describe factors to be considered in deciding to administer individual medicinal products	Drug or product labels may contain some or all of the following information: • trade name • scientific name of the drug • shelf life • contents of the container, including associated materials, such as water or alcohol • methods of administration • dosage • storage requirements • withdrawal times or limitations. The technician will also need to know: • the penalties to dairies that are found to violate chemical residue standards • additional rules or operating protocol when administering certain drugs • that drug withdrawal can be an issue in milk production, as well as in slaughter animals

Concept	Prescribed Specific Outcomes	Notes
(continued) • Handling Medications (continued)	*The student will:* • identify proper practices for handling and storing medications, which ensure optimum effectiveness and efficiency of each product • identify potential hazards that can contaminate medications • demonstrate operator behaviours for avoiding contamination when handling medications • identify and describe personal hazards and hazards to animals associated with handling, storing and administering medications • identify and demonstrate appropriate operator behaviour, which will minimize the risk of injury and damage to an operator or to an animal • demonstrate the correct technique to inject a drug, including controlling the flow and injecting: – intramuscularly—deeply into muscle – intravenously—into blood vein – subcutaneously—under loose skin – intradermally—into the skin – intrarumen—into the rumen, as in bloat – intraperitoneally—into the space inside the body cavity – intramammary—into the teat canal	• economic considerations—cost of treatment versus cost of not treating • the previous medical history of the animal or condition • the alternatives available • the risks of the treatment • the storage temperature required • how to control light during storage and when used out in the open • the risks and results of freezing • the effects of moisture contamination • that dirty needles and syringes can introduce contamination into the sealed drug bottles • that dirty equipment can spread disease among animals. Potential hazards include: • self-injection when handling a loaded syringe or applicator • using medication in unclean and unsanitary conditions. Hazards to animals may be eliminated or minimized through: • clean and sanitary operator practices • awareness of an animal's drug allergies • having all equipment ready before the job starts • having enough help available to perform the job effectively and efficiently • wearing proper protective clothing • medication being placed in the correct space or tissue • using aids or tools to ensure proper placement; e.g., choke rope • using a proper size needle for the particular job

Concept	Prescribed Specific Outcomes	Notes
(continued) • Handling Medications	*The student will:*	• properly preparing the area with alcohol or disinfectant • clipping hair, if necessary.
• Monitoring Calving	• identify and describe the normal stages of calving, including: – calf positioning – normal length of time required to calve – appearance of signs or progress indicators • identify and describe common calving problems that may require assistance • identify the farm's protocol for dealing with calving problems • describe symptoms of a cow getting ready to calve • monitor and inspect cows for calving • describe what to look for in deciding to provide minor assistance in calving • demonstrate consistent ability in providing minor assistance to a cow when calving • describe types of minor assistance that a technician may be required to perform to a calving cow, including: – chains on calf's feet – manipulation of calf's head – insertion of lubricant • demonstrate knowledge of when to call, whom to call and what to do when more advanced assistance is required during calving.	Normal stages of calving include: • position to be born • discharge of placental material and fluids • swollen vulva • restlessness • water bag engorges • feet first emergence of calf. Calving problems: • may or may not be experienced in a particular herd or breed • may include malpresentation; e.g., abnormal calf position, calf being too large for pelvic opening, twisted uterus, stillbirths, prolapse • may include uterus coming with the calf. Any assistance given to a calving cow must be appropriate and must not jeopardize the cow or calf's health. Calving assistance may be limited to easing a calf out, when it is obviously a normal birth presentation and the animal needs help following through.
Cattle Watering (continued)	• explain the importance of water consumption to dairy cattle • identify and describe factors other than thirst that affect cattle's water consumption • identify and describe key inspection areas, when conducting inspections of available watering systems	Different groups of cattle tend to have different needs, based on their body size and current milk producing status. Water consumption is affected by: • mineral content of the water • bacteria level in the water • taste

Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued) Cattle Watering	*The student will:* • perform minor service to watering equipment, as needed.	• odour • pollutants in the water • freshness of the water • water temperature.
Safety • Fire Extinguishers	• describe the basic components of fire • describe methods of controlling each component of fire • identify and describe classes of fires • identify the appropriate type of extinguisher material/fire extinguisher for each type of fire • identify classes of fires possible: – on a truck or tractor – in a farm shop – in a livestock building	Basic components are: • fuel • heat • air. Classes of fire include: • Class A—wood, crop residues. Use water to extinguish. • Class B—oil, gas. Use CO_2 or approved chemical extinguishers. • Class C—electrical. Use CO_2 or approved chemical extinguishers.
• Fire Extinguishers	• identify the hazardous areas and seasonal factors affecting fire risk: – on a truck or tractor – in a farm shop – in a livestock building • assess the cause or source of a fire, and take steps to prevent reignition • identify locations of fire extinguishers • determine the operating procedure for each type of fire extinguisher • read fire extinguisher labels, and determine the active operational time of each extinguisher	
• Emergency First Aid	• perform cardiopulmonary resuscitation (CPR) • aid a choking victim • treat severe bleeding • handle shock.	Students should have completed or be in the process of completing the emergency first aid course, which is a component of CTR1210: Personal Safety (Management).

Course: Animal Husbandry and Health 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
Personal Work Skills	• demonstrate employability skills, including: – verbal and nonverbal communication – goal setting and career planning – time management – basic financial management.	Students should be advised that their personal work skills will be expected to improve throughout their involvement in the Green Certificate Program. Assessment of personal work skills will be based on growth from previous assessments of personal work skills.

Course: **Dairy Operations 33**

Program: Green Certificate

Credits: 5

Corequisite: CTR1210: Personal Safety (Management)
Note: Students are required to complete the corequisite course prior to or concurrent with their enrollment in the first course of the Dairy Production Technician specialization.

Description: Students demonstrate the ability to handle livestock of all ages, operate milk-handling equipment, milk cows, operate milk sampling and recording equipment, read and interpret milk quality reports, maintain sanitation, demonstrate safe work skills and a positive attitude toward safety, and demonstrate effective and appropriate employability skills in a variety of workplace situations.

Parameters: Each of the three courses that constitute the Dairy Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate the ability to: – handle livestock of all ages – operate milk-handling equipment – milk cows – operate milk sampling and recording equipment – read and interpret milk quality reports	*Assessment of student achievement should be based on:* • ongoing assessment of student performance, which is conducted: – on a daily basis by the student on-farm trainer in regular consultation with the student's supervising teacher • certification testing, which is conducted by a Green Certificate Assessor designated by AAFRD and includes: – a performance assessment of practical knowledge and skills – a written examination. Successful completion of this course will be credited toward the attainment of the Dairy Production Green Certificate Technician credential.	40%

Course: Dairy Operations 33 (continued)

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will:		
• demonstrate the ability to: – maintain sanitation – clean and sanitize milk-handling equipment		15%
• maintain cattle health and breeding, by: – applying udder and teat treatment medications – recognizing symptoms of mastitis and administering basic treatment – recognizing and treating bloat – recognizing milk fever symptoms and following treatment protocol – detecting heat/estrus		20%
• demonstrate a positive attitude toward safety and safe work skills and habits, including: – safe personal work habits – care of farm equipment safety devices		15%
• demonstrate effective and appropriate employability skills.		10%

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
Milking Cattle • Milk-handling Equipment	• identify, name and describe components of a milking machine • describe the function and operation of each component • explain the following terms: – pulsation ratio – pulsation rate • describe the relationship of pulsation ratio and rate to the milking process • identify and describe the purpose of the vacuum system • identify and describe components of the milk-handling system, from milker to tank • describe how the milk-handling system works • outline and describe the key components and operations of the milk-handling system that need checking and inspecting: – prior to start-up – after start-up • carry out the appropriate routine to prepare the system for the milking operation and start-up procedure • monitor the milk-handling system during milking, and perform necessary adjustments/service • perform shut-down of the milk-handling system	A milking machine will usually consist of: • claws • shells • hoses • lines. More automated milking systems may incorporate: • automatic take-offs • control sensors • cleaning in place (CIP) washers. Cleanliness and sanitation are critical when working with milk-handling equipment. Start-up, operating and shut-down procedures may vary. Students must always accurately follow their supervisor's instructions.
• Milk Cows (continued)	• identify and describe hazards associated with milking and cow-handling operations • describe safe and appropriate operating behaviour when handling cows and milking a cow • identify and describe the possible consequences of improper cow handling prior to or during the milking process	Hazards include: • personal injuries—being kicked; hand, arm injuries • slipping on wet manure • being crushed by cow.

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	*The student will:*	
• Milk Cows	• describe the procedure and physiological processes that occur during a successful cow-milking process • prepare the udder properly for milking • identify and describe the following terms and/or practices: – forestripping – teat dipping – single towel washing – optional udder cleaning – washing styles • identify and describe key points of good milker conduct during the daily milking process • apply the milker routine, and milk the animal • use handling aids and appropriate operator behaviour to handle cows with behavioural and/or health problems or conditions • monitor milk production, and record each animal's milk production • carry out the teat dipping process	Upset cows become difficult to handle due to the release of additional adrenaline into the cows' body systems. Milk let-down is aided by gentle, soothing behaviour around cows; e.g.: • low noise levels • patience and slow movements • consistent routine. Forestripping: Handling of teats. Teat dipping: Use of antiseptic lanolin. Single towel washing: Use of a single towel per cow to prevent cross infections. Handling aids may include: • anti-kick devices • ropes • moving devices.
• Milk Sampling and Recording Equipment	• identify and describe the information recorded relating to daily milk records • explain why milk yield records are kept • identify and describe major types or styles of milk-recording equipment • explain the purpose/role of the Western Canadian Dairy Herd Improvement System (WCDHIS) • operate a milk-measuring system, during milking operations • identify and describe procedures used to prepare milk-sampling equipment for cleaning • clean milk-sampling equipment	Milk yield by weight or volume from the herd and from individual cows is recorded daily. Electronic flow-measuring equipment is in use on some dairy farms. This system enables accurate computerized recordings of milk yields.

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
• Cattle Behaviour and Cattle Handling	• identify and describe the basic nature of cow behaviour when they are eating, pasturing, and being herded or confined • describe the nature of cattle: – vision – hearing • describe visual incidents that can affect cow behaviour: – positively – negatively • describe situations where noise can be: – a positive influence on cows – a negative influence on cows • identify and describe personal hazards associated with cattle handling • describe strategies that can be used to minimize the effect of personal hazards and prevent personal injuries • demonstrate operator techniques and behaviour that result in effective cattle handling	Cows: • are alert • are curious • have sensitive hearing • are affected by loud noises • prefer diffused light • are affected by strange noises and strange people • are affected by different weather conditions • have a pecking order.
	• identify and describe the behavioural and handling differences among different age groups of cattle • describe the effect of weather on cattle eating and handling behaviour • explain the footing agility of cattle • describe surfaces on which cattle have: – good traction – poor traction • describe possible consequences of animal accidents • describe different ways that illness and disease can affect cattle behaviour • describe the effects of touch from slappers and other handling devices • describe how cattle react to pain	Behaviour patterns differ among: • heifers • mature cows • bulls and/or steers • calves • bigger cattle, which are more dangerous than smaller cattle.

Concept	Prescribed Specific Outcomes	Notes
• Cleaning and Sanitizing Milk-handling Equipment	*The student will:* • identify, describe and name chemicals used as cleaning and sanitizing agents on a dairy farm • describe the purpose of each cleaning and sanitizing agent and their sequence of use • explain the hazards associated with: – different chemical agents – mixing different chemical cleaning and sanitizing agents • describe appropriate operator behaviour to minimize the effects of potential hazards • set the milking and milk-handling equipment for wash cycle, and operate the farm's washing and cleaning equipment • clean and sanitize milking equipment that requires daily washing • describe the appropriate storage facilities and safe handling procedures for each chemical used.	
Cattle Health and Breeding • Udder and Teat Treatment Medications	• identify and describe common ailments and disorders that can occur to udders and teats • identify and describe the common teat and udder treatment medications and aids, and describe the hazards or precautions when using them • select the proper medication and prepare the proper dosage, following the supervisor's instructions • apply the medication, where necessary • describe the nature of udder edema, including its symptoms and the methods of treatment	The udder and teats can be affected by: • cold weather problems • sunburn and other skin problems • cysts or warts • wire damage—cuts from other sources • damage from dewclaws • being stepped on • mastitis • edema. Treatments include: • teat dipping solutions • teat injections by syringe applicator—infused in teat • dilators • first-aid products • salves and creams • sanitary conditions, which are essential to prevent infection.

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
• Mastitis	*The student will:* • define mastitis • identify and describe the basic nature and symptoms of dairy cow mastitis • describe the effects of mastitis on cows in Alberta • describe the basic anatomy and physiology of the teat canal, including: – sphincter muscle – keratin – sealant substance • identify and describe milking activities and other factors in management practices that can contribute to the incidence of mastitis • describe the udder and teat's natural defences against mastitis • detect a case of clinical mastitis, through: – a visual diagnosis of the udder – an examination of the pre-milking milk stream, during the regular course of the milking routine • read and interpret the farm's treatment protocol • perform necessary testing, treatment and follow-up for a case of mastitis • record, using proper documentation, the treatments provided for a case of mastitis • isolate affected cows prior to treatment, if farm protocol demands this	Mastitis is commonly known as inflammation of the udder. It is caused by bacteria. • Cows are infected via teat cistern or udder injury. • Symptoms are varied and are seen in the udder colour, size and temperature and in the visual characteristics of the milk. Mastitis is costly to Alberta dairy farms, causing milk loss—in quality and quantity—and treatment expense. Severe cases may affect a cow's future milk production. Anything that contributes to the passing of the disease can influence the incidence of mastitis. Prevention strategies include: • teat dips • sanitized milking machines; e.g., vacuum levels, inflations, pulsation ratios • minimizing stress to cows • manure cleaning frequency and bedding practices. Milk production from cows infected by mastitis must be withheld from the herd's production. Symptoms of mastitis include: • red, swollen, hot and tender udder • flaky, clotted and stringy milk.

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
• Bloat	• identify and describe the nature of cattle bloat • describe when it is likely to occur • describe symptoms that indicate a bloat condition • identify and describe treatment alternatives available • describe the advantages and disadvantages of using each type of treatment • identify and describe the farm's protocol for dealing with and treating bloat • identify the type of treatment that would be the most appropriate for the different kinds of bloat situations • recognize the symptoms of bloat in a cow, determine the nature of the condition; e.g., type, severity, and treat the bloat with exercise or drench	Students should be able to: • describe the working of the rumen and why gas is produced • use feeds that are less likely to lead to bloat. Bloat commonly comes from a high cereal diet or from grazing in lush pastures of alfalfa or clover. Gas buildup caused by bloat affects organs and breathing. Symptoms of bloat include: • swelling of the rumen, seen on the side of the animal • restlessness of animal • animal's breathing affected. Treatment for bloat includes: • exercise • drench • stomach tube • trocar and cannula. The farm supervisor must approve treatments with drench.
• Milk Fever	• identify and describe the nature of milk fever • identify and describe symptoms of milk fever • demonstrate the ability to recognize symptoms • describe possible causes of milk fever • identify and interpret the farm's protocol for dealing with milk fever • follow appropriate milk fever treatment protocols	Milk fever is usually caused by a nutrition imbalance in feed. Symptoms include the cow: • lying down • shivering • staggering • having cold ears • having an open mouth. The farm's supervisor must approve all milk fever treatments.

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
• Heat/Estrus	• define estrus • identify and describe the nature of estrus in dairy cattle • describe the stages of the estrus cycle • identify and describe opportunities for heat detection during daily cattle handling procedures • detect animals in heat.	Estrus/heat refers to the cow's receptiveness to breeding. The operator's ability to detect cows in heat at the optimal times is critical to the effective and efficient breeding protocol on a farm.
Personal Work Skills • Farm Equipment Safety Devices	• identify common areas on farm machines where safety shields are necessary • locate, read and interpret safety-related decals, symbols and signs • perform a safety inspection of equipment components • identify missing and damaged items • demonstrate the ability to perform basic repairs	Machinery requiring safety guards include: • augers • belts, chains, shafts • heat areas • cutters. Student knowledge and skills about farm safety will be enhanced through successful completion of: • CTR1210: Personal Safety (Management) • CTR2210: Workplace Safety (Practices).
• Personal Habits and Farm Safety (continued)	• identify the major types of hazards associated with running machinery • identify hazards associated with parked equipment • identify and describe safe and unsafe clothing in various farm situations • describe appropriate personal protective equipment (PPE) for various farm jobs • demonstrate appropriate safety practices when working with farm machinery • identify and describe situations on the farm where the following PPE items should be worn: – earplugs – eye protection – dust masks	Hazards include: • rotating parts; e.g., power take-off (PTO), belts, chains • hot surfaces and fluids • moving vehicles • hydraulics—holding up heavy parts • high pressure hydraulics and their potential for leaks onto skin • speed and power of moving parts • distractions causing loss of attention • rollover possibilities • more than one person working around machines • improper clothing • hair catching in rotating parts.

Course: Dairy Operations 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	*The student will:*	
• Personal Habits and Farm Safety	• demonstrate appropriate use of PPE • demonstrate safe and appropriate procedures to maintain tools and work areas in a clean and operational condition • identify and be able to access the following safety-related items: – fire extinguishers – first-aid kit – other safety equipment	
• Employability Skills	• demonstrate employability skills, including: – verbal and nonverbal communication – goal setting and career planning – time management – basic financial management.	Students should be advised that their personal work skills will be expected to improve throughout their involvement in the Green Certificate Program. Assessment of personal work skills will be based on growth from previous assessments of personal work skills.

Course: **Dairy Equipment Operation and Service 33**

Program: Green Certificate

Credits: 5

Corequisite: CTR1210: Personal Safety (Management)
Note: Students are required to complete the corequisite course prior to or concurrent with their enrollment in the first course of the Dairy Production Technician specialization.

Description: Students operate manure spreaders; maintain cattle health and breeding; feed the dairy herd; operate farm equipment; maintain fences and corrals, using fence amending tools; select and use basic hand and shop tools correctly; and demonstrate effective and appropriate employability skills.

Parameters: Each of the three courses that constitute the Dairy Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• maintain sanitation when operating manure spreaders in fields and on roads	• ongoing assessment of student performance, which is conducted: – on a daily basis by the student's on-farm trainer in regular consultation with the student's supervising teacher • certification testing, which is conducted by a Green Certificate Assessor designated by AAFRD and includes: – a performance assessment of practical knowledge and skills – a written examination. Successful completion of this course will be credited toward the attainment of the Dairy Production Green Certificate Technician credential.	25%
• maintain cattle health and breeding, by: – inspecting and monitoring physical facilities for proper environmental conditions		15%
• feed the dairy herd, by: – operating the feeding system and carrying out feeding routine		20%

Course: Dairy Equipment Operation and Service 33 (continued)

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will:		
• operate farm equipment, by: – operating and performing basic service on augers and conveyors – operating farm tractors in fields and on roads – demonstrating knowledge of road travel regulations – operating tractors with front-end loaders – operating and performing basic service on standby generators – operating portable feed milling and mixing equipment – maintaining fences and corrals, using fence amending tools – selecting and using basic hand and shop tools correctly		30%
• demonstrate effective and appropriate employability skills.		10%

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
Manure Spreaders	*The student will:* • identify and name the main operating components of a manure spreader • describe the use or function of each operating component of a manure spreader • identify dangerous parts and operating hazards of using a manure spreader • describe operator behaviours that will minimize the dangers when working with a manure spreader • identify and describe the servicing needs of a manure spreader • perform necessary servicing of a manure spreader • demonstrate safe tractor and equipment operating practices in transporting manure from loading to field spreading • demonstrate appropriate procedures for cold weather operation of a manure spreader.	Students must be properly trained to use a manure spreader and be advised of the spreading rates and patterns prior to being required to operate the equipment. Components of a manure spreader include: • rear discharge type spreader: – drive mechanism – spreading rate or speed control, if any – apron chains, beaters – flail types versus cylinder • open tank type spreader with side discharge: – drive mechanism, speed or rate controls – manure deflectors, unloading system or flails • closed or honey wagon tank type: – pumping mechanism – spreading system: injection or flood – any control system. The protocol for inspecting and servicing manure-spreading equipment may vary. Students should ensure that they receive and understand instructions for operating, inspecting and servicing manure spreaders before being required to perform any activity with the equipment.

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
Cattle Health and Breeding • Physical Facilities and Environmental Conditions	• identify, for each major cattle health and breeding facility, areas requiring periodic inspection, including: – cattle housing set-up – feeding system – milking and milk-handling machines • identify the frequency of inspections • identify and describe possible consequences that can result from failure to detect problems in health and breeding in the early stages, including such factors as: – liability – loss – damage – economic costs • demonstrate routine inspection practices that minimize problems and hazards.	Facilities and equipment that should be inspected frequently include: • ventilation systems • materials-handling equipment • augers, conveyors • utilities—piping, electrical • heating systems • furnaces and water heaters • pens • cattle control equipment • lighting • special requirements of cold and hot weather operations • bedding. Students will be expected to be self-directed and to demonstrate an ability to look around and identify items that need servicing. For example: • areas/items needing attention are noted for follow-up • livestock is monitored on a regular basis • cow heats are identified expediently.
Feeding Systems and Routines (continued)	• describe the feeding plan in place for different groups of animals: – weaned calves – yearling heifers – bred heifers – lactating cows – dry cows • describe the types of feedstuffs used • describe the nutritional purpose of each feedstuff used • monitor and report to the supervisor the results of operating a food plan	The technician needs to know the difference between maintenance, growing and fattening rations and the seasonal variations in feeding needs.

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued) Feeding Systems and Routines	*The student will:*	
	- identify and describe the farm's feeding protocol	
	- prepare the farm's feeding system for feeding, including any pre-feeding routine	
	- carry out the feeding routine for all stock	
	- identify and describe feed that is mouldy	Mouldy feed may appear white or brown, generate heat, smell, and have an unusual texture.
	- identify and describe the operation of common types of feeding equipment	
	- demonstrate proper operating procedure for the available feeding system	
	- perform minor adjustments to ensure optimal operation	
	- perform a health check during the feeding routine	
	- identify seasonal factors to be considered in carrying out a feeding routine	
	- identify the nutritional groupings within the herd requiring different feed rations, qualities and quantities	
	- perform routine cleaning and maintenance of feed bunks, troughs, salt feeders, mineral feeders and waterers.	
Farm Equipment - Auger and Conveyor Servicing	- identify the main operating parts of a screw-type auger	Auger parts include: - auger intake - drive mechanism - height adjustment mechanism - undercarriage.
	- describe the use or function of each part	
	- identify auger parts needing periodic service	
	- demonstrate proper service procedures on an auger	Service procedures may include: - lubrication of bearings - checking for structural damage - checking for safe operation of lifting mechanism.
	- identify hazards associated with operating a portable, screw-type grain auger positioned to move grain	
(continued)	- describe hazards associated with transporting an auger	

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	*The student will:*	
• Auger and Conveyor Servicing	• describe and demonstrate safety practices used to minimize the effects of each identified hazard • identify the components of a chain or paddle-type conveyor • describe safe operating and service procedures for chain or paddle-type conveyors • demonstrate correct loading and operation of an auger • demonstrate correct procedure for transporting, positioning and setting up an auger or conveyor	**Safety Notes:** • Never move an auger while it is running. • Lift the auger only when beside the granary. • Lower the auger before moving away from the granary. • Do not move augers alone.
• Farm Tractor Operations in Yards, on Fields and on Roads	• identify and describe the purpose and operation of tractor platform controls • describe the information presented on each gauge, and interpret its reading • list and describe items to be checked in a walk-around inspection before start-up, and carry out the inspection • demonstrate correct engine start-up and shut-down procedure • identify the recommended range of engine load and rpm • select the appropriate gear ratio to maintain rpm, taking into account the job to be done • demonstrate: – appropriate shifting and clutching procedures – independent brake usage – safe procedures for hooking up implements – safe highway and roadway operations • select the appropriate tractor capacity to do the job • describe tipping and rollover hazards in field situations, including those related to incorrect hitching to the tractor	
(continued)		

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	*The student will:*	
• Farm Tractor Operations in Yards, on Fields and on Roads	• describe hazards associated with using towropes, cables and chains, and demonstrate the correct placement of these items • demonstrate routine tractor servicing and lubrication, including: – oil and filter changes – hydraulic, fluid and water filter changes – cleaning and servicing for each type of air cleaner	
• Road Travel Regulations	• identify and describe lighting requirements for a tractor and towed equipment on public roads • identify and describe the signage for slow moving farm equipment • describe the weight restriction road ban system as it relates to tractor operations • identify operator qualifications and licencing requirements for tractors operating on public roads • identify and describe the requirements of ensuring clear visibility for the tractor operator and cleanliness standards for lights and licence plates	The *Highway Traffic Act* applies to all vehicles, including farm vehicles. Note: Driving a tractor with frosted windows is illegal.
• Tractors with Front-end Loaders	• describe hazards associated with operating a front-end loader • identify precautions to be taken to minimize hazards • identify items to be checked prior to starting a front-end loader • demonstrate the safe and efficient operation of a front-end loader to carry out a farm task • demonstrate safe and efficient procedures, when working on loader parts or on a tractor with an attached front-end loader	

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
	The student will:	
• Standby Generators	• identify and describe different types of standby generators commonly used in Alberta • identify and describe the function of the main components of an available standby generator • identify the economic and safety hazards of using standby power • describe appropriate safety practices when using standby generators • demonstrate the correct procedure to start up and operate a standby generator • demonstrate proper operation of farm electrical equipment during a period when a standby generator is supplying power • identify routine maintenance and servicing requirements of standby generators • perform routine service to a standby generator, as necessary	Types of standby generators include: • power take-off (PTO) type • engine type—fully automated or manual start • natural gas, diesel, gasoline. Components of standby generators may include: • drive unit • generator and gauges • switching apparatus • control devices. Safe operating procedures should follow the manufacturer's and/or supervisor's instructions.
• Portable Feed Milling and Mixing Equipment (continued)	• list and describe the main operating components of available portable feed milling and mixing equipment • describe the use or function of each component of available portable feed milling and mixing equipment • identify hazardous components and hazards associated with operating this kind of equipment • demonstrate safe practices to minimize hazards • describe the hazards associated with moving portable feed milling and mixing equipment • demonstrate appropriate procedures to prepare a unit for travel • select a tractor that meets the power requirements of a unit, when preparing to move the portable equipment	Main operating components include: • feeding mechanism; e.g., auger, chain • mixing bin • milling component • additive dispenser • power drive mechanisms. Students should ensure that they have received instruction and understand what needs to be done before using or servicing any item of farm equipment.

Concept	Prescribed Specific Outcomes	Notes
(continued)	*The student will:*	
• Portable Feed Milling and Mixing Equipment	• set up a mixer mill to produce a batch of feed • install or replace screens to produce desired materials • demonstrate correct loading and unloading procedures • demonstrate correct operating procedures of the milling and mixing equipment • identify the farm's general maintenance protocol, including lubrication and service of available portable feed milling and mixing equipment • demonstrate basic lubrication service and general maintenance operations on available portable feed milling and mixing equipment	
• Fence and Corral Maintenance	• identify and describe hazards associated with fencing • describe procedures to minimize hazards • demonstrate the correct selection, use and driving of staples to secure wires or insulators to a post • demonstrate the correct selection and use of tools and supplies for repairing wooden fences and corrals • demonstrate safe procedure for preparing, placing and setting wooden posts • demonstrate the correct placement and setting of metal posts prior to driving them • describe and demonstrate the correct construction of corner braces • describe and demonstrate the correct use of wire in constructing or repairing fences.	Safety hazards include: • breaking wire • hand/finger pinching by wire • back strain • footing/footwear.

Course: Dairy Equipment Operation and Service 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
Hand and Shop Tools	*The student will:* • identify different types and sizes of hand tools and accessories needed on a farm, including: – screwdrivers – hammers – chisels – wrenches – pliers – cutters – rasps • describe and demonstrate the safe and correct use of each type of available hand tool and accessory • demonstrate the correct selection and use of hacksaw blades for specific tasks • identify different types of power tools commonly used on a farm • describe the hazards associated with each power tool • demonstrate the correct use of each available power tool.	Screwdriver types include: • flat • Phillips • Robertson. Wrench types include: • box • open • adjustable • socket. Plier and cutter types include: • slip joint regular • pump type • side cutters • needle-nose • long-nose. Hammer types include: • nail • claw • ball-peen • mallets • sledge. Chisel types include: • cold • wood • punches • pin • centre drift. Rasp types include: • wood • metal • fine • coarse.
Personal Work Skills	• demonstrate employability skills, including: – verbal and nonverbal communication – goal setting and career planning – time management – basic financial management.	Students should be advised that their personal work skills will be expected to improve throughout their involvement in the Green Certificate Program. Assessment of personal work skills will be based on growth from previous assessments of personal work skills.

RESOURCES

The Green Certificate Program is supported by a variety of resources, including:

- *Off-campus Education Guide for Administrators, Counsellors and Teachers,* Alberta Education, 1997
- *Career Transitions Guide to Standards and Implementation*, Alberta Education, 1997
- *Beef Herd Operations: Cow–Calf Production Technician Skill Profile and Performance Standards,* AAFRD, Current Edition
- *Dairy Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Feedlot Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Field Crop Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Irrigated Field Crop Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Irrigated Field Crop Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Sheep Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Swine Farrow to Finish Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- Other specialization-related resources as listed in the current AAFRD Publications Guide.